

### **Linac Update**

Linac Work Through the Week Ending April 27, 2006

Running to NTF with the I- Ion Source  
Beam Current 36 ma

Ready to Run 400 MeV Beam to the Dump

#### Work done This Week

Characterized LRF3 and LRF4

Replaced the Power Amplifier in LRF3( it was sparking)

Replaced 4616 Driver In LRF4

#### Work Remaining to Do

Make LRF4 Power Amplifier Run

Finish Characterization of the Low Energy RF Systems.

Calibrate High Energy Linac RF Gradient and Phase Readbacks

Install Motor Drive for 10 MeV Collimator (parts have arrived)

Find and Repair Ground fault in LRF7 Modulator.

Rebuild LRF7 Driver

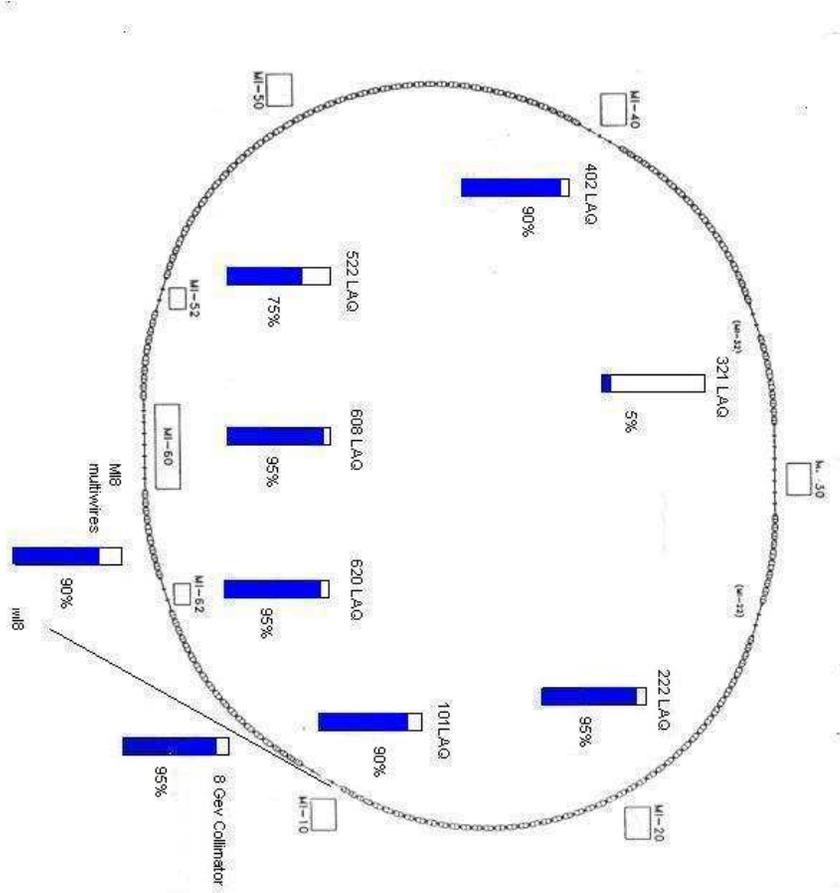
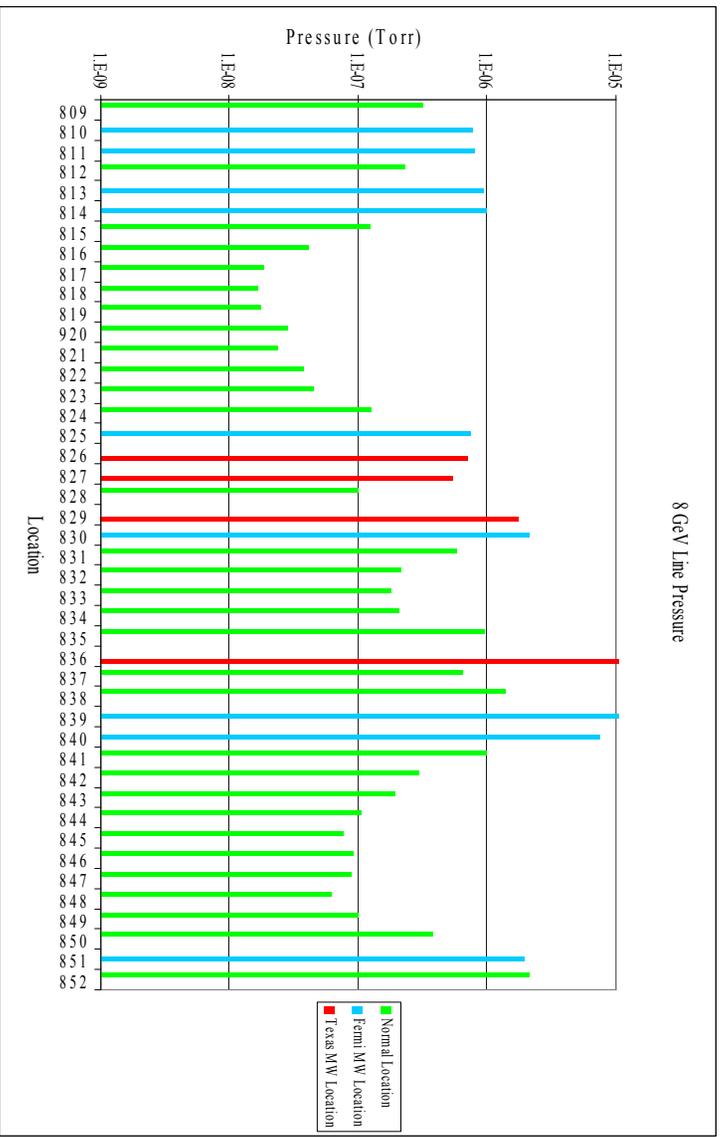
### **Main Injector**

## **MI Shutdown report**

D. Capista 4/28/06

- Continued vacuum repairs in the MI8 line.
- Continued vacuum repairs at 620.
- Began Lambertson bake at 101.
- Continued installation of large aperture quad at 521,522.
- Began instillation of the MI10 kicker cooling system.

8 GeV Line Pressure



## MI Startup (DRAFT)

### Power Supply Startup:

- Clear bus and Hipot.
- Main PS commissioning (New wide aperture quads).
- Establish ramps, slow magnet warm up.
- Beamline PS turn on and commissioning.

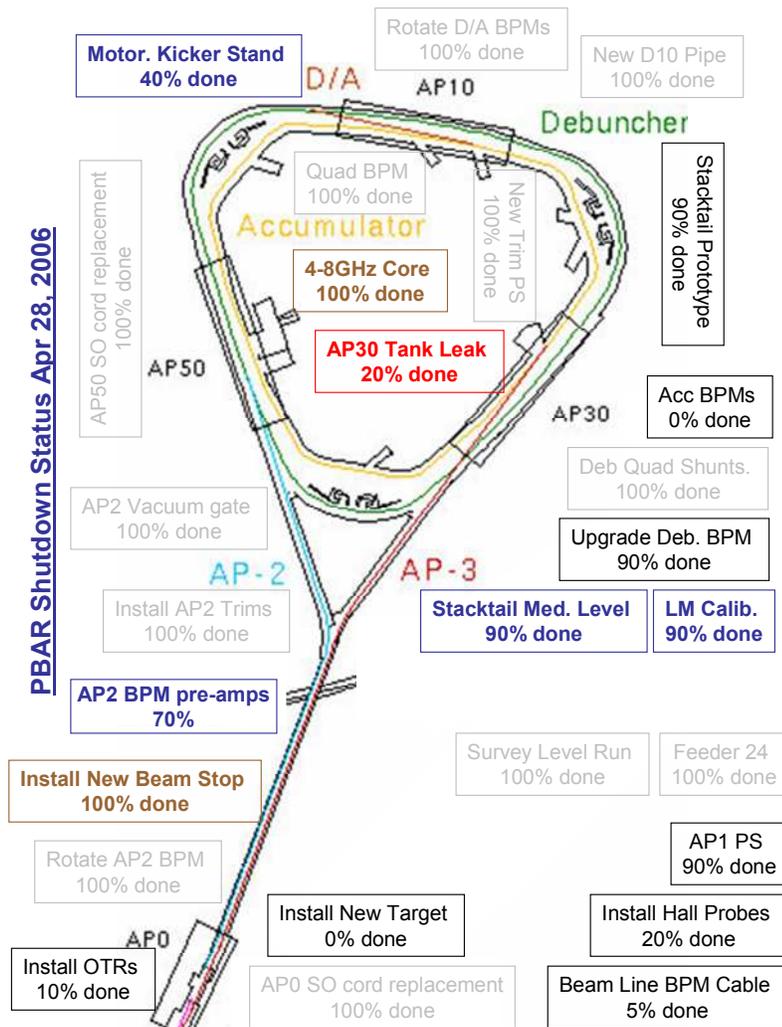
### Beam Startup:

- Establish 8 Gev. beam. 6 Hours.
- M18 line lattice measurements. 2x4 Hours.
- Establish 120 Gev. beam. Smooth orbits. 8 Hours.
- Commission lattice with new wide aperture quads 16 Hours.
- High field Orbit smoothing (quad moves). 16 Hours.
- Tune Up for Operation. 8 Hours.
- Extraction line tune up. 4 hours each (7).

### Startup Activities and Studies :

- Coalescing.
- Damper commissioning.
- NuMi Multibatch slip stacking.
- SY 120
- 8 Gev collimators
- Install and commission new BPM electronics.
- Install and commission new BLM electronics.
- Test software programs with Linux.
- Lambertson aperture scans.

## Pbar



Hope to have AP30 tank resolved next week.

## Booster

### Booster Shutdown Work - Week 9

- MI-8 Dump cable pull finished
  - Terminating cables (upstairs/downstairs)
  - Vacuum continues to improve
  - Kickers installed/connected – pulsing starts today
  - Cleaning up tunnel
- 400 MeV/ORBMP
  - Vacuum pump down continues
  - PS testing
  - Polarity Testing
- RF repair/maintenance continues
- Sump discharge re-route done today

## Schedule Issues

- MI-8 Dump on schedule – (tasks remaining)
  - Terminate and test supplies
    - Septa, V809 switches, Kickers, Beam Stop
- ORBMP – Finish PS work/testing
- 400 MeV PS/Polarity Testing
- RF work – Connect up Anode & 480
- Safety System checkout
- CUB LCW pumps – only 1 pump on now

Mau







### The Plan:

- 0700-0730 Master Sub goes off and this affects everything except for: Main Injector the Village, Mi 12a, Mi12b, Mi13, and Feeder 46a (cryo feeder).
- 0700-0830 Feeder 48 (Tev RF) will go off.
- At 0730-0745 Pbar AP10,30, and AP50 will be moved to master substation AP0 will not be affected at this time.
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### Plan Continued:

- 0900-1500 Power will be off in the Tevatron at E0, E1, E2, E3 to replace a transformer.
- (Special Note) Feeder 48 RF annual maintenance is currently scheduled for the day after all these substation outages from 0830-1700. (Currently Tuesday). Note: approximately a week later Feeder 48 goes down again

0800-0830 KRSS goes off.  
Feeder 48 will go off again in a week

Feeder 48 will go off again in a week

Updated 4/28/06	MONDAY 4-24-2006	TUESDAY 4-25-2006	Wed 4-26-2006	THURSDAY 4-27-2006	FRIDAY 4-28-2006	SATURDAY 4-29-2006	Sunday 4-30-2006
Owls 0000 to 0800							
DAYS 0800 to 1600	<p>0700-0730 Master sub power outage <b>Canceled</b> Date to be scheduled later</p> <p>Start linac back up after pwr outage. -after Master sub outages power down E0,E1,E2, E3 for 6 hrs -Possible <u>Tev</u> water start up. <u>A0 house pwr outage 4 hrs AM</u></p>	<p>NTF-PT</p> <p>Java/Oac shutdown 8 hrs</p> <p>0815-1600 Feeder 48 <u>tev</u> RF cancelled</p> <p>Outage will be on Kautz rd till approx Friday switch back will cause 30-40 minutes pwr outage)</p>	<p><u>Tev</u> Rd closure 1 bldg at a time A1,A2,A3,F4,F3</p> <p>0815-1600 Feeder 38 central Helium liquefier (CHL) power outage</p> <p>0800Wed to 1600 Thursday LB2 compressor at CHL off for 32 hrs</p>	<p>NTF PT</p> <p>0630-0700 maintenance on the FCC Core Router</p> <p>LB2 transformer off at CHL til 1600</p> <p>0800 Thursday til 0800 Friday ML11 @ms1 xformer in meson off 24 hrs to ad oil</p>	<p>NTF PT</p>	<p>0600-0800 <u>Booster tie switch</u> <u>All booster down</u></p> <p>0815-1130 <u>Booster east gallery,towers,tunnel</u></p> <p>1300-1600 <u>Booster west gallery,tower,and tunnel</u> <u>Pwr outage</u></p>	
EVES 1600 to 2400							

Schedule can be found at <http://www-bd.fnal.gov/operations/schedules.html>

Updated 4/27/06	MONDAY 5-1-2006	TUESDAY 5-2-2006	WEDNESDAY 5-3-2006	THURSDAY 5-4-2006	FRIDAY 5-5-2006	SATURDAY 5-6-2006	Sunday 5-7-2006
Owls 0000 to 0800					Booster secure	Booster secure Start testing some Booster PS booster	
DAYS 0800 to 1600	<p>NTF-PT</p> <p>- 0700-0730 master sub off</p> <p>-0700-0830 FDR 48 <u>Tev</u> RF off</p> <p>-0730-0745 Pbar stays off.</p> <p>-0800-0830 Kautz Road sub off</p> <p>Start linac back up after pwr outage.</p>	<p>0815-1600 Feeder 48 <u>tev</u> RF</p>	<p>NTF-PT</p> <p>Kautz RD substation on Master sub</p>	<p>NTF PT</p>	<p>Booster secure Friday Morning controlled access</p> <p>Friday afternoon booster PS testing Start testing some Booster PS booster</p>	<p>0700- 1600 Power outages for Mp9,MW9, MSB,MDW,MD E,SITE 40(LOW Rad Waste) MCRO</p>	
EVES 1600 to 2400				Change Booster door cores to normal cores S&S booster,	Booster secure Start testing some Booster PS booster		

Updated 4/27/06	MONDAY 5-8-2006	TUESDAY 5-9-2006	WEDNESDAY 5-10-2006	THURSDAY 5-11-2006	FRIDAY 5-12-2006	SATURDAY 5-13-2006	Sunday 5-14-2006
Owls 0000 to 0800						Run seperators	→
DAYS 0800 to 1600	NTF-PT If approved Zebra mussel kill begins  Feeder 46a turned off will be on generators for 5 days MEANS A0 PWER OUTAGE DURING SWITCH OVER	Fix cable connection at C0 on Feeder 46a	NTF-PT A0 oil switch replacement feeder 46a down A0 ON generators  Kautz RD substation on Master sub	NTF-PT 1400 every one out of Tey tunnel beging Search and secure of tevatron. 1400 start door core change back to normal tev dor cores	Power up feeder 46a A0 off generators MEANS ANOTHER A0 POWER OUTAGE	Run seperators  0700-1700 feeder 45(TEV) conventional power outage	→
EVES 1600 to 2400				1630-0030 bi-annual tevatron safety system testing 1700 S&S CDF/D0? For safety system tests		Search and secure tev Run seperators	→

Schedule can be found at <http://www.bd.fnal.gov/operations/schedules.html>

Updated 4/27/06	MONDAY 5-15-2006	TUESDAY 5-16-2006	WEDNESDAY 5-17-2006	THURSDAY 5-18-2006	FRIDAY 5-19-2006	SATURDAY 5-20-2006	Sunday 5-21-2006
Owls 0000 to 0800							
DAYS 0800 to 16	NTF-PT Kautz RD harmonic filter work no power outage	Kautz RD Harmonic filter work no power outage	NTF-PT -0700 to ? MDE pwr outage  Kautz RD substation on Master sub  A3 Conning tower work complete	NTF PT -0815 to ? MDW 5, 6, 10, 14 power outage  Booster in controlled access	CHL cold	0700-1700 Feeder 44 Wilson Hall power outage 10 hrs	
EVES 1600 to 2400							

Schedule can be found at <http://www.bd.fnal.gov/operations/schedules.html>

Updated 4/27/06	MONDAY 5-22-2006	TUESDAY 5-23-2006	WEDNESDAY 5-24-2006	THURSDAY 5-25-2006	FRIDAY 5-26-2006	SATURDAY 5-27-2006	Sunday 5-28-2006
Owls 0000 to 0800							
DAYS 0800 to 16	NIF-PT 0900 meeting Jim Morgan Resumes as run coordinator  Booster beam start up  Start TEV Ring cooldown  TeV RF on  TeV tunnel closed Any access request has to be approved by the run coordinator		NIF-PT 0900 meeting   This week beam start up will occur in Booster, Mi, Recycler and Pbar. Priorities will be set by the run coordinator	NIF PT   TeV Cold	0900 meeting		
EVES 1600 to 2400							

Schedule can be found at <http://www.bd.fnal.gov/operations/schedules.html>

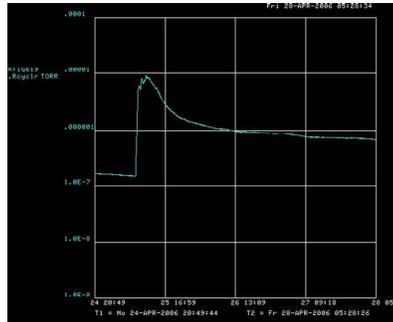
June 2006 updated 2/21/06 (draft)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4
				Booster/Mi/Pbar start up		Endo of shutdown
5	6	7	8	9	10	11
		<b>Start up</b>				
12	13	14	15	16	17	18
		<b>Start up</b>			1 <sup>st</sup> store	Hep
19	20	21	22	23	24	25
			Hep			
26	27	28	29	30		
			Hep			

Wrong breaker was installed in Feeder 40.

Recycler

## Recycler Ring Work

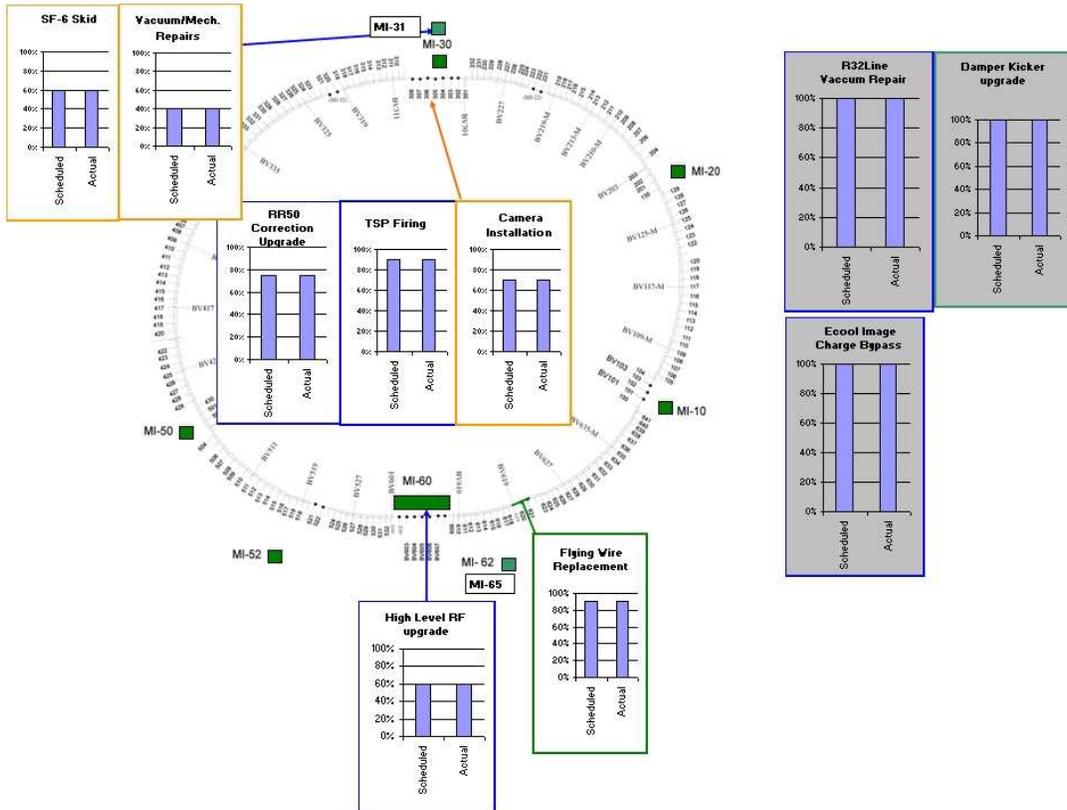
- Flying Wire Installation
  - Bake underway since Tues
  - Termination will most likely May 1<sup>st</sup> (Monday)
- General Alignment
  - Some 14 magnet moves have been requested to reduce correction element strengths around the ring
- Damper Region Q527-Q601
  - Magnetic Shielding Restored -Done
  - Dampers has been aligned -Done
  - BPM's need to be reconnected
  - Dampers needs to be connected/Testing may commence



## Ecool Work

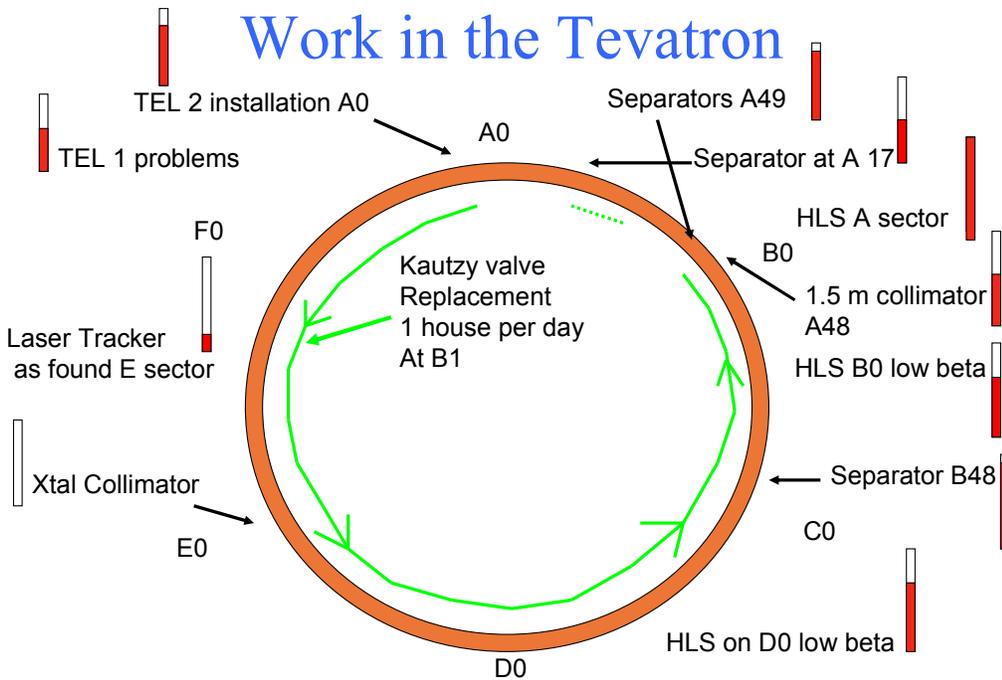
- SF<sub>6</sub> skid replacement -60% complete
- Shafts replacement- Done
  - Shaft has been spun and everything looks to be ok
- Gun modulator repair and testing -50% complete
- Venting up gun acceleration tube
  - Scheduled to commence Monday May 1<sup>st</sup>
  - Replace TSP
  - Replace Ion Gauge
  - Inspect Electron gun
  - Measure Magnetic Fields in cathode section





## Tevatron

### Work in the Tevatron



## TEL 1 returned to A0 4-27



### Jobs not yet started

- Re align low beta quads at B0 week of May 1
- HOPs cable pull
- A3 conning tower replacement, TD will to do conning towers in A3 next week

NuMI

# NuMI - Shutdown – Week 9

**Horn 2 Repair – Successfully Tested the Repaired RAW Leak**  
**Drained and Refilled Horn 1 and 2 RAW Systems**  
**Changed Horn 2 DI Bottle and High Potted OK**  
**Planning on Horn 2 Pulsing for Next Week**  
**Clapper Valve Installed on Horn 1 Raw System**  
**Target Chase Chiller Delivery Expected Mid Next Week**  
**Drains in Target Hall Being Covered to Reduce Area Humidity**  
**Electric Installed and Ready for New Desiccant Units**  
**Prism Well Underway with Dehumidification Duct Work**  
**New Motorized Damper Installed Above Door to DK Passageway**  
**OTR Installed and Surveyed in the Pre-Target**  
**New Pre-Target Drip Ceiling Installed**  
**Concrete Coring Complete for Various Piping and Electric**  
**Excavation and Concrete Work in Process at SR3**  
**Conduit In and Concrete Pour Today**  
**Reworking HV Cables & Connections at New Motorized 13.8 Switch**

## ES&H

### ES&H

- Safety System Upgrades
  - Booster 60% Complete
    - Booster Dump Move Configuration Changes
      - LG1 area work started
        - Cables pulled to into the tunnel
        - New logic chassis being installed
        - Enclosure status pages updated for the new configuration
      - Booster Staging Area gate was replaced by mechanical support
    - Documentation submitted for Approval to Operate
  - Main Injector 40% Complete
    - Lower Level Controlled Access Displays Replaced
      - MI-62 & MI-30 complete. 5 Buildings left.
    - Main Injector Coasting Beam System changes
      - Lam10 Critical Device Interface Installation complete
    - Stairwell cleaning continues
      - MI Ring cleaning is complete.
      - Looking at the 8 GeV line stairwells.

## ES&H

### ■ Safety System Upgrades

- Tevatron 98% Complete
  - F-Sector Radiation Monitor Card Replacement
  
- MT6 Section 1 & 2 70% Complete
  - Enclosure Interlock System Upgrade
  
- Safety System Testing
  - All areas need to be re-tested before startup
  - Plan is to change Booster door cores Thursday evening
  - Booster Electrical Safety System testing is tentatively scheduled for 6:00 pm May 4th

## ES&H

### ■ Radiation Exposure

- ~8.8 R total dose for the first 8 weeks of the shutdown.

### ■ No shutdown related injuries or incidents report.

- Your efforts to continually address safety in our work planning have prevented injuries during this shutdown.

### ■ Transition to Operations

- Pressure to complete work to resume operations.
- It's the people that make the machines run.
- Pressures to operate are not a reason to cut corners when it comes to working safely.

## MiniBooNE

### Spring Shutdown 2006

#### MiniBooNE

- Horn:
  - Complete (it works).
  - Reconnect old horn by May 8.
- RAW System:
  - Complete.
- Alignment:
  - Week of May 1.

## SY120

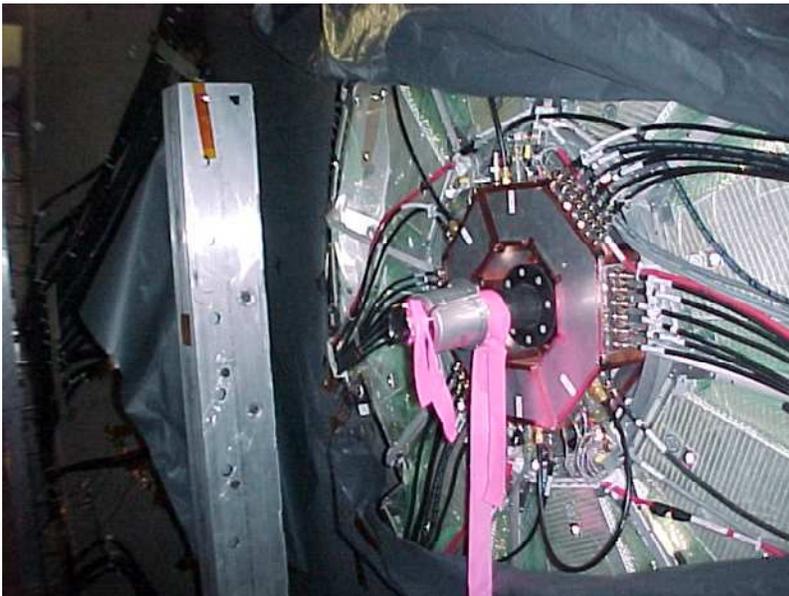
Still have quad installation and multiwire requests  
F3 Manhole and Sy alignment request

## D0

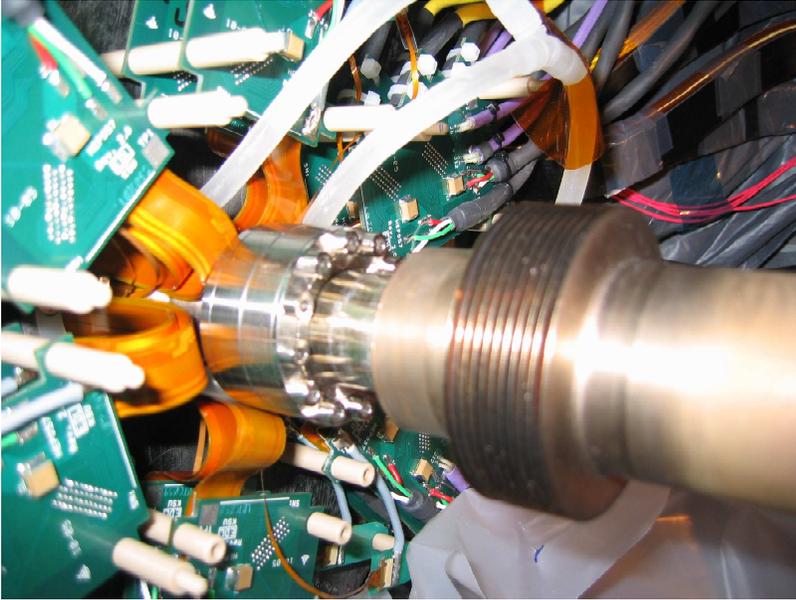
## Week 9

- **Layer 0**
  - Complete evaluation of Layer 0 readout performance
    - All SVX4 chips have been successfully readout with the sensors biased
  - Connect spool pieces and leak check joints
  - Re-install south inner H disk
- **Level 1 Calorimeter Trigger**
  - Delivery of lower skew LVDS cables complete
  - Continue installing LVDS cables
  - Test transmission from ADF to TAB
  - Continue firmware debugging/development/verification
- **Level 1 Central Track Trigger**
  - Finish connecting outputs to L1CalTrk and L1Muon
  - Verify outputs to L1CalTrk and L1Muon
- **Luminosity Monitors**
  - Re-install and re-cable

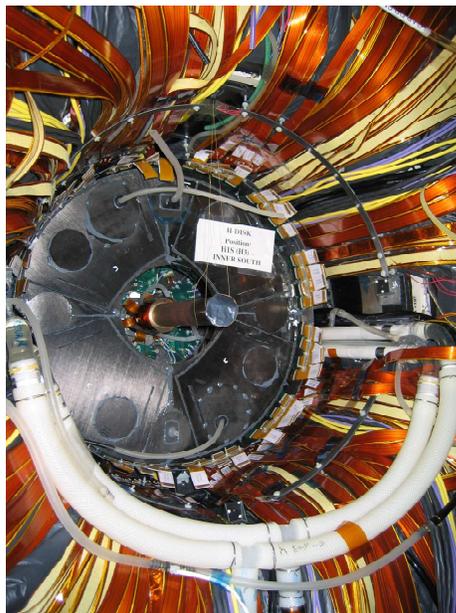
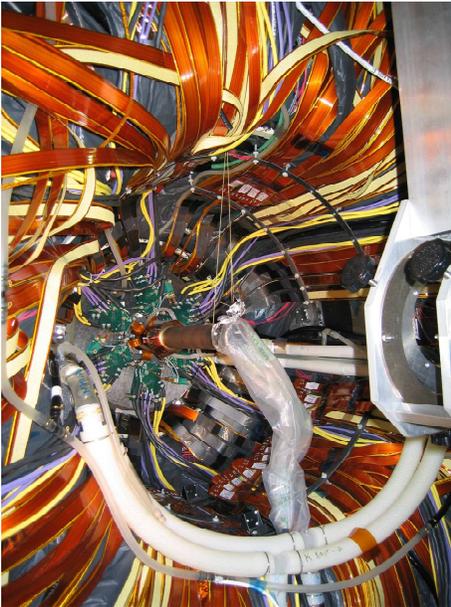
## Installed Luminosity Monitor



Spool piece connected to Be beam pipe



Re-installing South Inner H Disk



## Layer 0 Installation Milestones

ID	TASK NAME	Actual	Current Forecast	Pre-Shutdown Forecast	Milestone Dates
2	Beginning of RunIIb Tevatron Shutdown	2/23/06		2/27/06	2/27/06
28	Detector Open, Ready for Access	3/1/06		3/2/06	3/07/06
34	RunIIa Be Beam Pipe Disconnected	3/3/06		3/7/06	3/9/06
47	H Disks Removed	3/15/06		3/17/06	3/23/06
56	RunIIa Be Beam Pipe Removed	3/21/06		3/27/06	3/31/06
75	Layer 0 Tooling and Mounts Ready	4/5/06		4/10/06	4/17/06
79	Layer 0 Installed (including junction card mounts)	4/7/06		4/12/06	4/19/06
91	RunIIb Be Pipe Connected, Layer 0 Cabled	4/26/06		4/26/06	5/03/06
94	Inner H Disks Re-Installed (including cabling)		5/2/06	5/2/06	5/9/06
99	Silicon Cold and Ready for Technical Commissioning		5/5/06	5/5/06	5/12/06
103	Complete Technical Commissioning of Silicon		5/11/06	5/11/06	5/18/06
118	Detector Closed for Tevatron Resumption		5/31/06	6/02/06	6/4/06

### CDF

On tour - inbar bar was run into - legacy .  
Reason is a procedure step  
Low beta quad moved by .25"  
Corrected omission in their procedure.

Luminoisty monitor phototubes being replaced - finish by Monday  
STT work finished by middle of next week  
DAQ testing with full detector.  
Also run with 14 of 18 L2 sub-farms

### Alignment

#### Alignment Schedule for April 28 2006

##### □ Tevatron

- > Completed As found E10-E15.
- > Scheduled CDF Low Beta Alignment

##### □ Main Injector

- > Scheduled Wide Aperture Quad
- > Scheduled Align barrier cavity at MI604

##### □ Recycler

- > Completed Cooling Kicker Tank
- > Completed Alignment suspect magnets

## Alignment Schedule for April 28 2006

- 8Gev
  - Scheduled To Complete Pipe and New Toroid
  - Scheduled BPM Alignment to continue.
- P-Bar
  - Completed Girder Check
  - Scheduled ceramic beam tube alignment

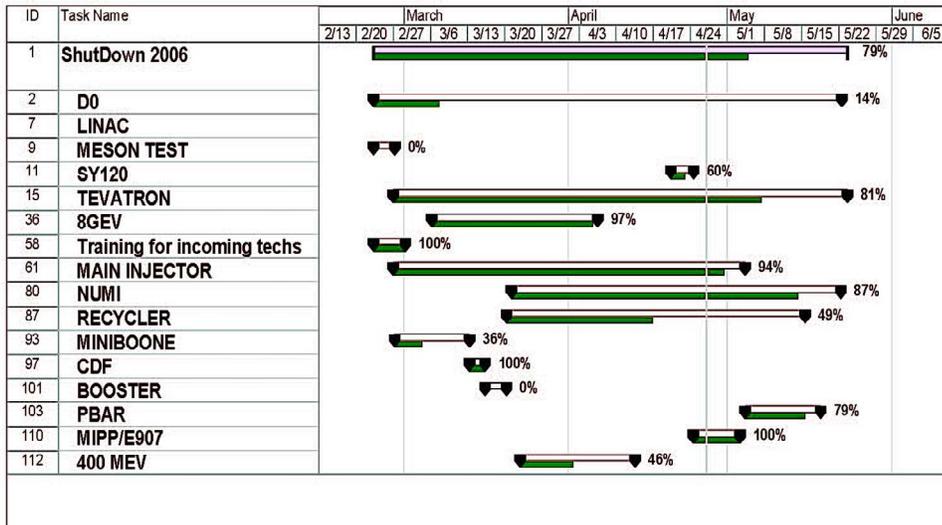
## Alignment Schedule for April 28 2006

- MiniBooNE
  - Scheduled May 1 Monday
- Numi
  - Completed Re-Survey Multiwire and OTR.
  - Scheduled Horn check. Thursday
- 400Mev
  - Scheduled Tuesday

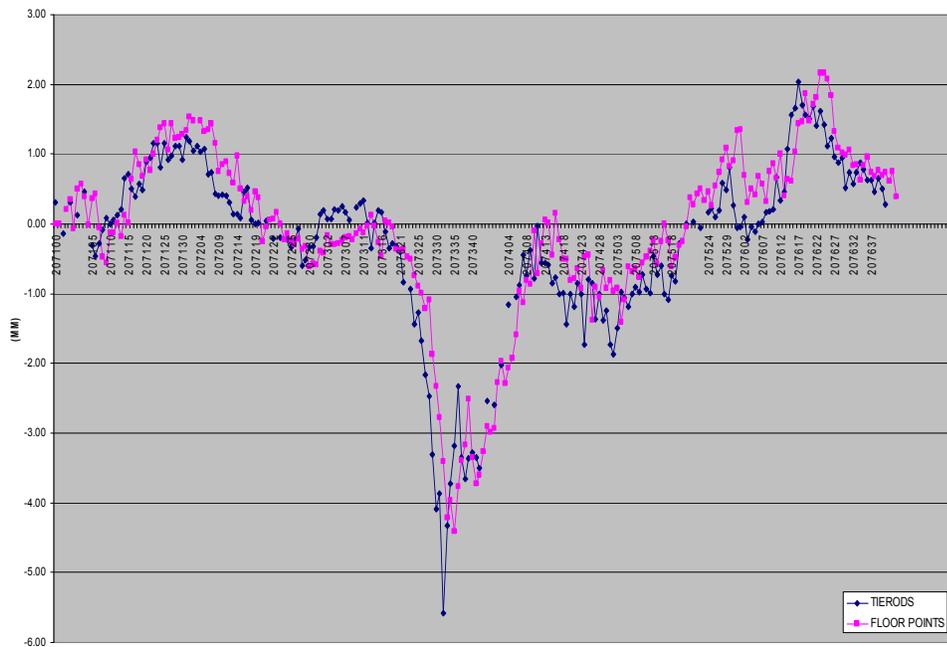
## Alignment Schedule for April 28 2006

- Add On's
  - **DO** Make Level-Run vertical measurement of select Collision Hall monuments West Wall
  - **Main Injector** Align barrier cavity at MI604 location.
  - **Fess** - the Batavia Rd. Guardhouse project .
  - **Fess** - MI Ponds C&D project will replace existing manholes and pipe .
  - **Switchyard** Check the alignment of elements in Switchyard manhole enclosure F3.
  - Scheduled CDF Low Beta Alignment

# Progress as of April 28 2006



TIERODS AND FLOOR POINTS vs 15-JAN-01 ADJUSTMENT



Main Injector -

RF

Mechanical

Worried about 8 Gev work, Texas Multiwires  
 Hope repair in AP30 water leak in tank fix works

Cryo

**AD/Cryogenics Dept**  
**Shutdown 2006 Status Report**  
**4/28/2006 (Makara/Olesen)**

**Cryo Operations:**

- Tevatron at LN2 temperature and LN2 usage is stable with vendor deliveries running only 2-3 truckloads per day due to the Tevatron being 1/4 at room temperature. Helium losses are slightly up at 18 kscf/day (1/2 of normal during Tev operations), some of the loss was replenished with A0 GHe Recovery from the test caves.
- A1 and A3 are at room temperature and isolated with LOTO.  
D1 and F4 are also at room temperature, have been reconnected by Cryo, and are under helium flow. D1 is ready for Division sign-off.  
F4 cooldown will wait until TEL-1 is re-installed.  
B4 and E2 were cooled down to LN2 temperature.  
A3 has been completed by MSD, but spool piece conning towers will be retrofitted (5 out of 8 leak) by Tech Division during this shutdown. Cryo has completed epoxy of helium leaks on Tevatron power lead and snoop leak tested fine.
- Pbar D60 Debuncher tanks have been reconnected to system and we are awaiting Division sign-off before cooling down to LN2 temperature.
- ACNET application programs relating to FRIG operations continue to be tested on Linux consoles.
- Nitrogen Reliquefier startup is delayed due to concern of "old" electrical cables being used for cross-connect between MSS and KRSS, especially due to high startup currents of 3000 hp TSI compressor.
- MCR monitoring cryo operations.

**CHL Maintenance:**

- General facility maintenance is in progress, including testing of relief valves per FESHM.
- CHL Helium Compr "A" cooling tower installation has been completed with only some minor work is left, such as fencing; system testing is commencing.
- CHL Helium Compr "D" is being overhauled.
- Helium Coldbox-2 controls upgrade is in progress.
- Mobile Helium Purifier is being derimed at room temperature and piping modified.

**FRIG Maintenance:**

- Various FRIG bldg vacuum maintenance and instrumentation repairs (e.g. lost charge on VPTs) are in progress, as well as support work on houses at room temperature and other equipment as things fail even during the shutdown period.
- Various Mycom compressor maintenance: leak hunting and general repairs, F0#3 motor starter replacement in progress.
- Wet expanders overhauls have been completed for A1 through F4, including Pbar. CDF remain to be done.
  - Reciprocating cold compressors are being overhauled for A4, B1, and C4.
- Kautzky relief valves have been replaced from B1 through F4 (20/24). Pace is at one house per day though running into problems with galling nuts on clamp's T-bolts and bad compression fittings. More Clamp T-bolts are on order.
  - We have been finding some leaking quick-disconnect fittings on conning towers. We have none in stock and thus ordered units expected next week.

**Meeting Notes:**

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Controls

Fine, except need to schedule Feeder 40.,

Zebra Mussels

## Zebra Mussel Infestation

*Dreissena polymorpha*

Fermi National Accelerator Laboratory

Batavia, IL

### Agenda

- Proposed Treatment
  - EVAC Introduction Stage
  - Flushing Stage

